Rocky Flats Environmental Technology Site

4-I51-ENV-OPS-FO.33

REVISION 0

TREATED EFFLUENT RECIRCULATION OPERABLE UNIT 1, BUILDING 891

APPROVED BY: S.G. Stiger / 12-8-94

Director, Environmental Restoration Program Division — Print Name: S.G. Stiger — Date: 12-8-94

S. LUKER / 12-2-94

Quality Assurance Program Manager, Data Management and Reporting Services — Print Name: S. LUKER — Date: 12-2-94

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Environmental Operations Management
Industrial Hygiene
Occupational Safety
Radiological Health and Engineering
Surface Water Division
Operable Unit 1 Closure

USE CATEGORY 3

DOCUMENT CLASSIFICATION REVIEW WAIVER PER CLASSIFICATION OFFICE

ORC review not required

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1-24	12/22/94	94-DMR-00018

TOTAL NUMBER OF PAGES: 24

TABLE OF CONTENTS

1. PURPOSE

This procedure provides instructions for recirculating treated effluent from the Building 891 Groundwater Treatment Facility for 881 Hillside, Operable Unit 1.

This procedure ensures that the treated effluent is recirculated properly to meet the performance standards in the Interim Measures/Interim Remedial Action Plan and Decision Document, 881 Hillside Area, Operable Unit 1, for discharge to the South Interceptor Ditch.

2. SCOPE

This procedure applies to the Building 891 Project Manager, Building 891 Operator, and all Environmental Operations Management employees and subcontractors.

This procedure addresses the following topics:

- Ion exchange recirculation from treated effluent storage tank(s)
- Ultraviolet/hydrogen peroxide (UV/H_2O_2) and ion exchange recirculation from treated effluent storage tank(s)
- Treated effluent storage tank recirculation without treatment

3. OVERVIEW

The Building 891 Groundwater Treatment Facility consists of the following five systems:

- A groundwater recovery and storage system
- A UV/H_2O_2 oxidation system
- An ion exchange system with units for acid and caustic regeneration of resin
- A spent regenerant neutralization system
- A treated effluent storage and discharge system

This procedure describes the steps needed to recirculate treated effluent in the following three systems:

- The UV/H_2O_2 oxidation system
- The ion exchange system
- The treated effluent storage and discharge system

A diagram of the system piping arrangement is shown in Appendix 1, Groundwater Recovery/Storage System Diagram.

If the analytical results from sampling of the treated effluent storage Tanks T-205, T-206, and T-207 indicate that the treated effluent exceeds an ARAR for one or more constituents, then the tanks are recirculated through the UV/H_2O_2 oxidation system or the ion exchange system in accordance with this procedure. The Interim Measures/Interim Remedial Action Plan and Decision Document, 881 Hillside Area, Operable Unit 1, should be used for questions reguarding performance standards.

3. OVERVIEW (continued)

The treated effluent storage tanks may also be recirculated through the system without additional UV/H_2O_2 treatment to ensure adequate mixing before sampling the tanks.

All equipment controls and valves for controlling the Groundwater Treatment Facility systems are located in Building 891. A complete list of valve designators, nomenclature, and types is provided in Appendix 2, Valves.

Each subsection of the major Instructions Sections is a stand alone section that may be performed independently of other subsections.

4. RESPONSIBILITIES

4.1 Operator

Operates the treated effluent storage tank recirculation system.

4.2 Project Manager

Arranges for the collection and analysis of samples from the treated effluent storage tanks.

Instructs the Operator when and how to use the recirculation system for the treated effluent storage tanks.

Documents Operator training in accordance with 2-F94-ER-ADM-02.01, Training and Personnel Qualifications.

Supervises the operational lock requirements for the appropriate valves.

5. LIMITATIONS AND PRECAUTIONS

- The level of Tank T-203 shall be observed before recirculation through the UV/H_2O_2 oxidation system to ensure adequate capacity for the volume of liquids to be processed through the UV/H_2O_2 oxidation system.

- The following recirculation isolation valves shall remain Locked Closed at all times when recirculation is not occurring:
  - HVC-205, T-205 Recirculation
  - HVC-206, T-206 Recirculation
  - HVC-207, T-207 Recirculation

6. PERFORMANCE DOCUMENTS

Operator

[1] Obtain the following documents, as necessary:

- 4-I52-ENV-OPS-FO.34, Ion Exchange System Normal Operations Operable Unit 1, Building 891
- 4-I53-ENV-OPS-FO.35, Ultraviolet/Hydrogen Peroxide Oxidation System Normal Operations, Operable Unit 1, Building 891.

7. PREREQUISITES

7.1 Planning and Coordination

Project Manager

[1] Verify that the Operator is trained in handling the recirculation systems for the Building 891 Groundwater Treatment Facility.

[2] Arrange for the collection and analysis of samples from the following treated effluent storage tanks to be discharged:

- T-205
- T-206
- T-207

7.3 Field Preparation

Project Manager

[1] Verify that the level of Tank T-203 has a level of 2.6 ft available for the volume of liquids to be processed through the UV/H_2O_2 oxidation system before recirculation through the UV/H_2O_2 oxidation system.

[2] Verify that the samples of the tanks to be discharged are collected and analyzed in accordance with the Sampling and Analysis Plan for Operation and Maintenance of the Interim Measures/Interim Remedial Action for the 881 Hillside Operable Unit No. 1 and 4-B35-ER-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Samples.

[3] Direct the Operator to recirculate the contents of the treated effluent storage tank(s) through the ion exchange system, in accordance with Section 8, Instructions - Ion Exchange Recirculation from Treated Effluent Storage Tank(s), or the UV/H_2O_2 oxidation system, in accordance with Section 9, Instructions—UV/H_2O_2 and Ion Exchange Recirculation from Treated Effluent Storage Tank(s) for additional treatment, as necessary.

[4] Record all activities in the Daily Log including date, time, and activity.

8. INSTRUCTIONS—ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S)

Project Manager

[1] Ensure that the recirculation valves for the tanks that will not be recirculated are CLOSED and apply an operational lock to the following valves:

- HVC-205, T-205 Recirculation
- HVC-206, T-206 Recirculation
- HVC-207, T-207 Recirculation

[2] Record valve positions and prerequisite actions completed in the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Operator

[3] Close HVB-203, IX Feed From T-203.

[4] Close the following valves:

- HV-500, Recirculation from Effluent Storage Tanks
- HV-501, Recirculation to UV
- HV-503, Recirculation

[5] Open HV-502, Recirculation to IX.

[6] Open the following valves:

- V-1, P-1 Service Inlet
- V-2, P-1 Service Outlet
- V-3, Bag Filter Outlet
- V-4, IX-1 Inlet Isolation
- V-5, IX-1 Outlet Isolation
- V-6, IX-2 Inlet Isolation
- V-7, IX-2 Outlet Isolation
- V-8, Degasifier Inlet Isolation
- V-9, Degasifier Outlet/P-2 Inlet
- V-10, P-2 Outlet
- V-11, IX-3 Inlet Isolation
- V-12, IX-3 Outlet Isolation
- V-13, IX-4 Inlet Isolation
- V-94, IX-4 Effluent
- V-95, Plant Effluent
- V-130, IX-2 Effluent Isolation
- V-131, IX-4 Effluent Isolation

[7] Open the appropriate valves for the tank to be recirculated:

8. INSTRUCTIONS—ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S) (continued)

Operator (continued)

[A] For Tank T-205, open HVA-205, Plant Effluent/T-205 Influent and HVC-205, T-205 Recirculation.

[B] For Tank T-206, open HVA-206, Plant Effluent/T-206 Influent and HVC-206, T-206 Recirculation.

[C] For Tank T-207, open the following valves:
- HVA-207, Plant Effluent/T-207 Influent
- HVC-207, T-207 Recirculation
- HVD-207, T-207 Isolation

[8] Place the ion exchange system in operation in accordance with 4-I52-ENV-OPS-FO.34.

[9] **IF** an alarm occurs on the IX Control Panel,
THEN check system status and notify the project manager.

The system automatically shuts down under the following conditions:
- Overpressure on P-1, P-2, P-3
- Low Flow on P-1, P-2, P-3
- Flow Failure on BLR-1, BLR-2
- Degassifier High Sump Level
- Degassifier Low Sump Level
- Degassifier Air Temperature
- High Differential Pressure on BLF-1, BLF-2
- High Differential Pressure on IX-1, IX-2, IX-3, IX-4
- Motorized Valve Failure

[10] **WHEN** recirculation is completed,
THEN:

[A] Shut down the ion exchange system in accordance with 4-I52-ENV-OPS-FO.34.

8. INSTRUCTIONS—ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S) (continued)

Operator (continued)

[B] Close the following valves:

- HV-502
- V-1
- V-2
- V-3
- V-4
- V-5
- V-6
- V-7
- V-8
- V-9
- V-10
- V-11
- V-12
- V-13
- V-94
- V-95
- V-130
- V-131

[C] Close the appropriate valves:

[a] For Tank T-205, close HVA-205 and HVC-205.

[b] For Tank T-206, close HVA-206 and HVC-206.

[c] For Tank T-207, close the following valves:

- HVA-27
- HVC-207
- HVD-207

Project Manager

[11] Lock CLOSED, with an Operational Lock, one of the following valves, as required:

- HVC-205
- HVC-206,
- HVC-207

Operator

[12] Record all activities in the Daily Log including date, time, and activity.

9. INSTRUCTIONS—UV/H_2O_2 AND ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S)

Project Manager

[1] Insure that the recirculation valves for the tanks that will not be recirculated are CLOSED, and apply an operational lock to the appropriate valves:

- HVC-205, T-205 Recirculation
- HVC-206, T-206 Recirculation
- HVC-207, T-207 Recirculation

[2] Record valve positions and prerequisite actions completed on the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Operator

[3] Close HVB-201, Effluent from T-201 and HVB-202, Effluent from T-202.

[4] Open HV-501, Recirculation to UV.

[5] Close the following valves:

- HV-500, Recirculation from Effluent Storage Tanks
- HV-502, Recirculation to IX
- HV-503, Recirculation

[6] Open HVA-203, UV Effluent to T-203 and HVB-203, IX Feed From T-203.

[7] Open the following valves:

- V-1, P-1 Service Inlet
- V-2, P-1 Service Outlet
- V-3, Bag Filter Outlet
- V-4, IX-1 Inlet Isolation
- V-5, IX-1 Outlet Isolation
- V-6, IX-2 Inlet Isolation
- V-7, IX-2 Outlet Isolation
- V-8, Degasifier Inlet Isolation
- V-9, Degasifier Outlet/P-2 Inlet
- V-10, P-2 Outlet
- V-11, IX-3 Inlet Isolation
- V-12, IX-3 Outlet Isolation
- V-13, IX-4 Inlet Isolation
- V-94, IX-4 Effluent
- V-95, Plant Effluent
- V-130, IX-2 Effluent Isolation
- V-131, IX-4 Effluent Isolation

[8] Open the appropriate valves for the tank to be recirculated:

9. INSTRUCTIONS—UV/H_2O_2 AND ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S) (continued)

Operator (continued)

[A] For Tank T-205, open HVA-205, Plant Effluent/T205 Influent and HVC-205, T-205 Recirculation.

[B] For Tank T-206, open HVA-206, Plant Effluent/T206 Influent and HVC-206, T-206 Recirculation.

[C] For Tank T-207, open the following valves:
- HVA-207, Plant Effluent/T-207 Influent
- HVC-207, T-207 Recirculation
- HVD-207, T-207 Isolation

[8] Verify that FCV-4, UV Effluent Control is OPEN.

[9] Place the UV/H_2O_2 system in operation in accordance with 4-I53-ENV-OPS-FO.35.

Program Manager

[10] **IF** the ion exchange system is **NOT** to be used during recirculation
THEN notify the Operator.

Operator

[11] **IF** ion exchange system bypass operation is required,
THEN:

[A] Turn off the ion exchange system in accordance with 4-I52-ENV-OPS-FO.34.

[B] Close the following valves:
- V-94
- HVA-203
- HVB-203

[C] Open V-80 and V-108.

[12] **IF** ion exchange system operations are needed,
THEN place the system in operation in accordance with 4-I52-ENV-OPS-FO.34.

[13] **WHEN** recirculation is completed,
THEN:

[A] Shut down the UV/H_2O_2 system in accordance with 4-I53-ENV-OPS-FO.35.

9. INSTRUCTIONS—UV/H_2O_2 AND ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S) (continued)

Operator (continued)

[B] Shut down the ion exchange system in accordance with 4-I52-ENV-OPS-FO.34.

[C] Close the following valves:

- HV-501
- HVA-203
- HVB-203
- V-1
- V-2
- V-3
- V-4
- V-5
- V-6
- V-7
- V-8
- V-9
- V-10
- V-11
- V-12
- V-13
- V-94
- V-95
- V-80
- V-108
- V-130
- V-131

[D] Close the appropriate valves:

[a] For Tank T-205, close HVA-205 and HVC-205.

[b] For Tank T-206, close HVA-206 and HVC-206.

[c] For Tank T-207, close the following valves:

- HVA-207
- HVC-207
- HVD-207

9. INSTRUCTIONS—UV/H_2O_2 AND ION EXCHANGE RECIRCULATION FROM TREATED EFFLUENT STORAGE TANK(S) (continued)

Project Manager

[14] Lock CLOSED, with an Operational Lock, one of the following valves, as required:

- HVC-205
- HVC-206
- HVC-207

Operator

[15] Record all activities in the Daily Log including:

- Date.
- Time.
- Activity.

10. INSTRUCTIONS—TREATED EFFLUENT STORAGE TANK RECIRCULATION WITHOUT TREATMENT

Project Manager

[1] Ensure that the recirculation valves for the tanks that will not be recirculated are CLOSED and apply an operational lock to the appropriate valves:
- HVC-205, T-205 Recirculation
- HVC-206, T-206 Recirculation
- HVC-207, T-207 Recirculation

[2] Record valve positions and completed prerequisites on the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Operator

[3] Open HV-502, Recirculation to IX and HV-503, Recirculation.

[4] Close HV-501, Recirculation to UV and HV-500, Recirculation from Effluent Storage Tanks.

[5] Close the following valves:
- V-2, P-1 Service Outlet
- V-95, Plant Effluent
- V-128, Gamma Detection Isolation

[6] Open the appropriate valves for the tank to be recirculated:

[A] For Tank T-205, open HVA-205, Plant Effluent/T-205 Influent and HVC-205, T-205 Recirculation.

[B] For Tank T-206, open HVA-206, Plant Effluent/T-206 Influent and HVC-206, T-206 Recirculation.

[C] For Tank T-207, open the following valves:
- HVA-207, Plant Effluent/T-206 Influent
- HVC-207, T-207 Recirculation
- HVD-207, T-207 Isolation

[7] Verify that the Ion Exchange Auto switch is OFF.

[8] Energize the Ion Exchange Control Panel by placing the Input/Output switch to ON.

[9] Start Pump P-1 by placing the selector switch on the Ion Exchange Control Panel to HAND.

10. INSTRUCTIONS—TREATED EFFLUENT STORAGE TANK RECIRCULATION WITHOUT TREATMENT (continued)

Operator (continued)

[10] **IF** sampling for discharge of a treated effluent storage tank,
THEN :

[A] Recirculate the tank for a minimum of 60 min. before sampling.

[B] Perform sampling and analysis in accordance with 4-B35-ER-OPS-FO.13.

[C] Take the samples at V-96, Plant Effluent Sample Port.

[11] **WHEN** recirculation is complete,
THEN stop Pump P-1 by placing the selector switch to OFF.

[12] De-energize the Ion Exchange Control Panel by placing the Input/Output switch to OFF.

[13] Close HV-502 and HV-503.

[14] Close the appropriate valves for the tank that was recirculated:

[A] For Tank T-205, close HVA-205 and HVC-205.

[B] For Tank T-206, close HVA-206 and HVC-206.

[C] For Tank T-207, close the following valves:
- HVA-207
- HVC-207
- HVD-207

[15] Record all activities in the Daily Log including:
- Date.
- Time.
- Activity.

11. RECORDS

Management of all records is consistent with 1-77000-RM-001, Records Management Guidance for Records Sources.

11. RECORDS (continued)

Project Manager

[1] Ensure that the original and one copy of the following quality-realated records, as appropriate, are transmitted to the ERPD Project File Center in accordance with 2-G18-ER-ADM-17.01.

- Data forms as delineated in 4-I52-ENV-OPS-FO.34 and 4-I52-ENV-OPS-FO.35
- Daily logs

Submission of record copies to the ERPD File Center satisfies Administrative Record requirements as defined in 3-21000-ADM-17.02, Administrative Records Screening and Processing.

There are no nonquality records generated by this procedure.

12. REFERENCES

Interim Measures/Interim Remedial Action Plan and Decision Document, 881 Hillside Area, Operable Unit 1

1-77000-RM-001, Records Management Guidance for Records Sources

2-F94-ER-ADM-02.01, Training and Personnel Qualifications

2-G18-ER-ADM-17.01, Quality Assurance Records Management

3-21000-ADM-17.02, Administrative Records Screening and Processing

4-B35-ER-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Samples

4-I52-ENV-OPS-FO.34, Ion Exchange System Normal Operations Operable Unit 1, Building 891

4-I53-ENV-OPS-FO.35, Ultraviolet/Hydrogen Peroxide Oxidation System Normal Operations, Operable Unit 1, Building 891

APPENDIX 1
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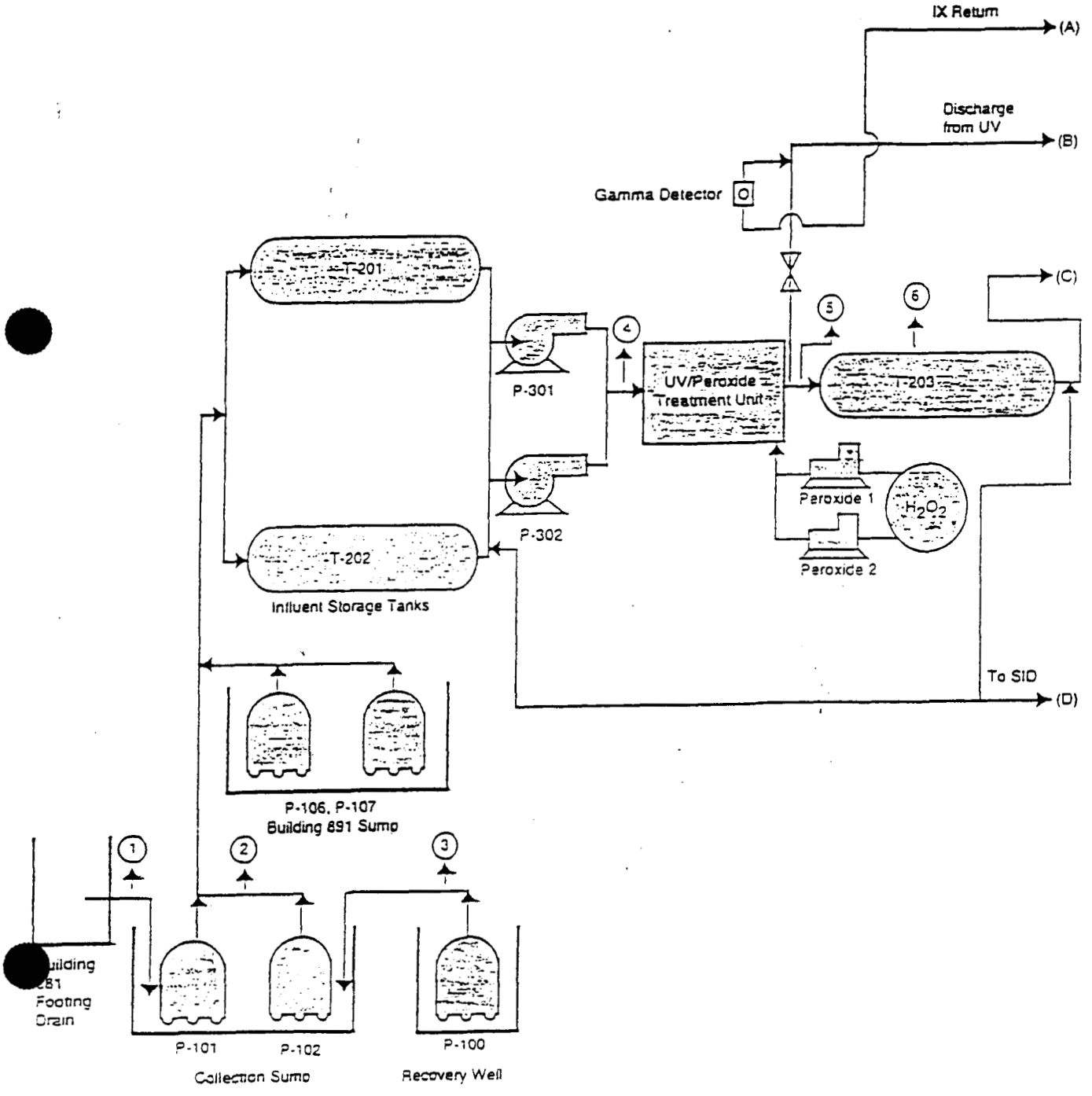
GROUNDWATER RECOVERY/STORAGE SYSTEM DIAGRAM



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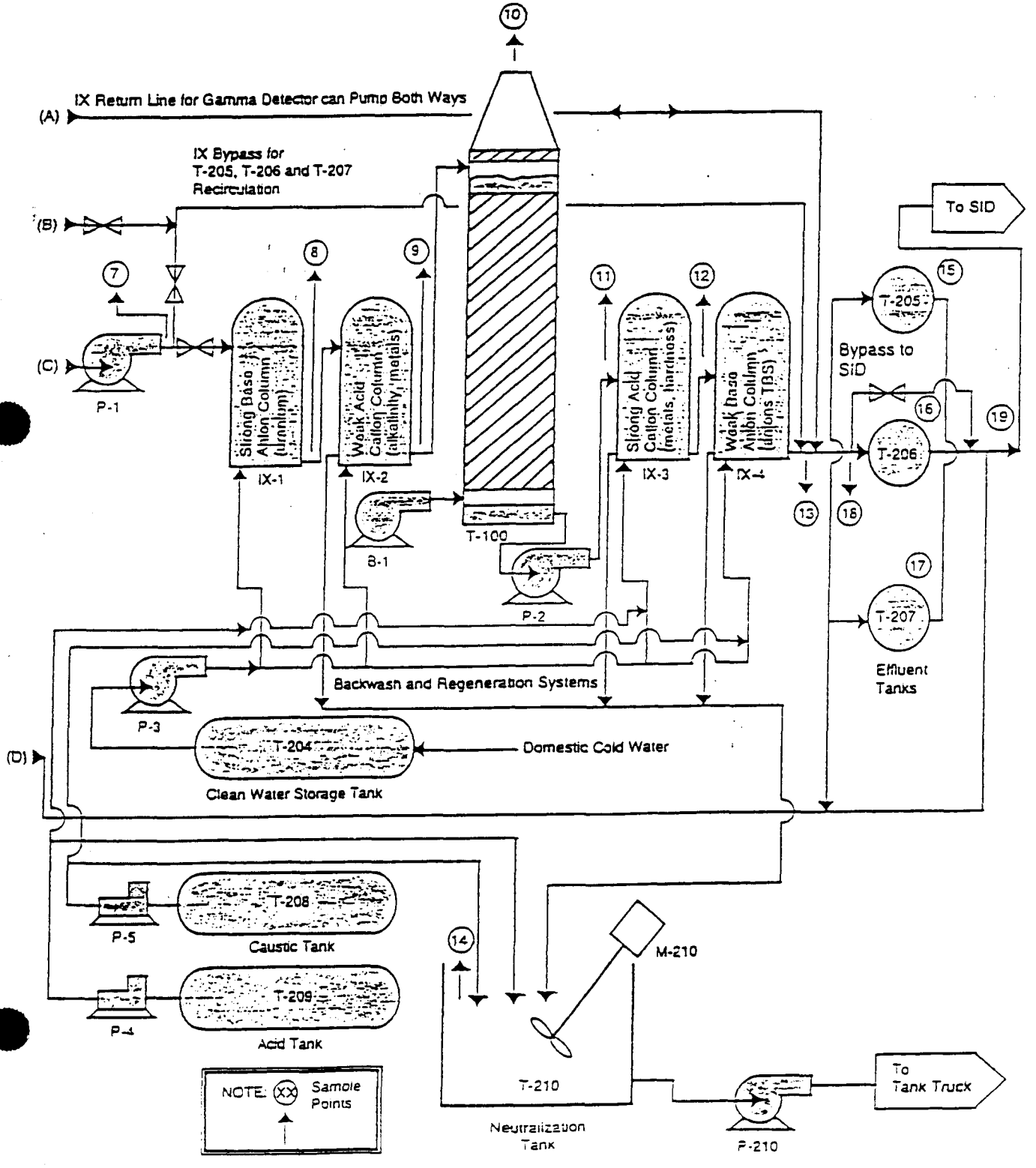

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VALVES

VALVE NO.	DESCRIPTION	TYPE
V-1	P-1 Service Inlet	2-in. Ball
V-2	P-1 Service Outlet	2-in. Ball
V-3	Bag Filter Outlet	2-in. Ball
V-4	IX-1 Inlet Isolation	1 1/2-in. Ball
V-5	IX-1 Outlet Isolation	1 1/2-in. Ball
V-6	IX-2 Inlet Isolation	1 1/2-in. Ball
V-7	IX-2 Outlet Isolation	1 1/2-in. Ball
V-8	Degasifier Inlet Isolation	1 1/2-in. Ball
V-9	Degasifier Outlet/P-2 Inlet	1 1/2-in. Ball
V-10	P-2 Outlet	1 1/2-in. Ball
V-11	IX-3 Inlet Isolation	1 1/2-in. Ball
V-12	IX-3 Outlet Isolation	1 1/2-in. Ball
V-13	IX-4 Inlet Isolation	1 1/2-in. Ball
V-14	UV #2 Sample Port	1/2-in. Ball
V-15	P-3 Inlet	2-in. Ball
V-16	P-3 Outlet	3-in. Ball
V-17	IX-2 Subsurface Backwash Inlet	2-in. Ball
V-18	IX-1 Subsurface Backwash Inlet	2-in. Ball
V-19	IX-3 Subsurface Backwash Inlet	2-in. Ball
V-20	IX-4 Subsurface Backwash Inlet	2-in. Ball
V-21	Bag Filter #2 Inlet	2-in. Ball
V-22	Bag Filter #2 Outlet	2-in. Ball
V-23	Caustic Makeup Water	1-in. Ball
V-24	Acid Makeup Water	1-in. Ball
V-25	P-5 to T-210 Influent	1 1/2-in. Ball
V-26	P-4 to T-210 Influent	1 1/2-in. Ball
V-27	P-5 Service Outlet	3/4-in. Ball
V-28	P-4 Service Outlet	3/4-in. Ball
V-29	P-5 Service Inlet	3/4-in. Ball
V-30	P-4 Service Inlet	1-in. Ball
V-31	T-208 Outlet	3/4-in. Ball
V-32	T-209 Outlet	1-in. Ball
V-33	BLR-2 Outlet	1 1/2-in. Ball
V-34	Degasifier Drain	1-in. Ball
V-35	Bag Filter 2 Drain	1/2-in. Ball

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VALVE NO.	DESCRIPTION	TYPE
V-36	Bag Filter 1 Drain	1/2-in. Ball
V-37	P-5 Caustic Sample Port	1/4-in. Ball
V-38	P-4 Acid Sample Port	1/4-in. Ball
V-39	IX-2 Effluent Sample Port	3/4-in. Ball
V-40	IX-1 Effluent Sample Port	3/4-in. Ball
V-41	IX-3 Sample Port	3/4-in. Ball
V-42	IX-4 Sample Port	3/4-in. Ball
V-43	IX-2 Vent	3/4-in. Ball
V-44	IX-1 Vent	3/4-in. Ball
V-45	IX-3 Vent	3/4-in. Ball
V-46	IX-4 Vent	3/4-in. Ball
V-47	IX-2 Acid Regenerant	1 1/2-in. Ball
V-48	IX-3 Acid Regenerant	1 1/2-in. Ball
V-49	IX-4 Caustic Regenerant	1 1/2-in. Ball
V-50	P-100 Outlet	1 1/2-in. Ball
V-51	P-101 Outlet	1-in. Ball
V-52	P-102 Outlet	1-in. Ball
V-53	Collection Gallery Filter Inlet	2-in. Ball
V-54	Collection Gallery Filter Bypass	2-in. Ball
V-55	Collection Gallery Filter Outlet	2-in. Ball
V-56	P-101, P102 Effluent	2-in. Ball
V-57	T-201, T-202 Influent	2-in. Ball
V-58	Domestic Influent Backflow Preventor	2-in. Ball
V-59	Domestic Influent Backflow Preventor	2-in. Ball
V-61	T-201 Secondary Containment Purge	2-in. Ball
V-62	T-202 Secondary Containment Purge	2-in. Ball
V-63	UV Influent T-201, T-202 Secondary Containment Purge	2-in. Ball
V-64	UV Influent T-201 Secondary Containment Purge	2-in. Ball
V-65	Caustic Dilution Water Flow Control	3/4-in. Gate
V-66	Acid Dilution Water Flow Control	3/4-in. Gate
V-67	Caustic Pressure	2-in. Ball
V-68	Acid Pressure	2-in. Ball
V-69	UV Effluent T-203 Secondary Containment Purge	2-in. Ball
V-70	T-204 Secondary Containment Purge	2-in. Ball
V-71	Chemical Metering Isolation	3/4-in. Ball
V-72	Chemical Metering Isolation	3/4-in. Ball
V-73	T-201 and T-202 Secondary Containment Purge	2-in. Ball

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VALVE NO.	DESCRIPTION	TYPE
V-74	UV Effluent Camlock	2-in. Ball
V-75	UV Basket Strainer Influent	2-in. Ball
V-76	Basket Strainer Camlock	2-in. Ball
V-77	P-301, P-302 Effluent Camlock	2-in. Ball
V-78	UV Influent Sample Port	1/2-in. Ball
V-79	UV #1 Effluent Sample Port	1/2-in. Ball
V-80	Gamma Detection Isolation	2-in. Ball
V-81	H_2O_2 Tank Sample Port	1/2-in. Ball
V-82	H_2O_2 Outlet	1/4-in. Ball
V-83	Chemical Metering Isolation	3/4-in. Ball
V-84	H_2O_2 P-1 Influent	1/4-in. Ball
V-85	H_2O_2 P-2 Influent	1/4-in. Ball
V-86	T-209 Influent Line Sample Port	1/4-in. Ball
V-87	T-208 Influent Line Sample Port	1/4-in. Ball
V-88	H_2O_2 P-1 Effluent	1/4-in. Ball
V-89	Air Scour Unloader	1 1/2-in. Butterfly
V-90	H_2O_2 P-2 Effluent	1/4-in. Ball
V-91	H_2O_2 Splitter Pump Influent	1/2-in. Ball
V-92	Splitter Pump Purge	1/2-in. Ball
V-93	UV Chamber #1 Effluent Pressure	1/2-in. Ball
V-94	IX-4 Effluent	1 1/2-in. Ball
V-95	Plant Effluent	2-in. Ball
V-96	Plant Effluent Sample Port	1-in. Ball
V-97	T-210 Purge Port	1/2-in. Ball
V-98	T-210 Sightglass	2-in. Ball
V-99	P-210 Effluent Isolation	2-in. Ball
V-100	P-210 Discharge Isolation	2-in. Ball
V-101	T-210 Effluent Bypass	2-in. Ball
V-102	Influent Secondary Containment Purge	2-in. Ball
V-103	Truck Dock Influent	2-in. Ball
V-104	Truck Dock Influent Secondary Containment Purge	2-in. Ball
V-105	Influent Line Secondary Containment Purge	2-in. Ball
V-106	Effluent Tank Bypass (underground)	N/A
V-107	UV #1 Drain	1/2-in. Ball
V-108	Recirculation Isolation	2-in. Ball
V-109	UV #2 Drain	1/2-in. Ball
V-110	Makeup Water	2-in. Ball

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VALVE NO.	DESCRIPTION	TYPE
V-111	Inlet H_2O_2 Rotameter 1	1/2-in. Gate
V-112	Inlet H_2O_2 Rotameter 2	1/2-in. Gate
V-113	Inlet H_2O_2 Rotameter 3	1/2-in. Gate
V-114	Outlet H_2O_2 Rotameter 1	1/2-in. Ball
V-115	Outlet H_2O_2 Rotameter 2	1/2-in. Ball
V-116	Outlet H_2O_2 Rotameter 3	1/2-in. Ball
V-117	T-210 Recirculation Isolation	2-in. Ball
V-118	IX Feed Camlock	2-in. Ball
V-119	PSIG IX-1 Purge	1/4-in. Ball
V-120	PSIG IX-2 Purge	1/4-in. Ball
V-121	PSIG IX-2 Purge (no gauge)	1/4-in. Ball
V-122	PSID IX-2 Purge	1/4-in. Ball
V-123	PSID IX-3 Purge	1/4-in. Ball
V-124	PSIG IX-3 Purge	1/4-in. Ball
V-125	PSIG IX-4 Purge	1/4-in. Ball
V-126	PSIG UV #1	1/2-in. Ball
V-127	PSIG UV #2	1/2-in. Ball
V-128	Gamma Detection Isolation	2-in. Ball
V-129	Recirculation Purge	1-in. Ball
V-130	IX-2 Effluent Isolation	2-in. Ball
V-131	IX-4 Effluent Isolation	2-in. Ball
V-132	T-204 Clean Water Line Sample Port	1/4-in. Sample Cock
HV-107	Sump Pump Discharge	2-in. Ball
HV-108	Sump Pump Discharge	2-in. Ball
HV-500	Recirculation From Effluent Storage Tanks	2-in. Ball
HV-501	Recirculation to UV	2-in. Ball
HV-502	Recircualtion to IX	2-in. Ball
HV-503	Recirculation	2-in. Ball
FV-7	Dilute Acid for T-210 Neutralization	1 1/2-in. Auto
FV-9	Acid Regenerant	1 1/2-in. Auto
FV-17	Dilute Caustic for T-210 Neutralization	1 1/2-in. Auto
FV-19	Caustic Regenerant	1 1/2-in. Auto
FV-1A	IX-1 Service Inlet	1 1/2-in. Auto
FV-2A	IX-1 Backwash Inlet	1 1/2-in. Auto
FV-5A	IX-4 Backwash Outlet	1 1/2-in. Auto
FV-8A	IX-1 Fast Rinse Inlet	2-in. Auto

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VALVE NO.	DESCRIPTION	TYPE
FV-10A	IX-1 Fast Rinse Outlet	2-in. Auto
FV-11A	IX-1 Air Scour Inlet	1 1/2-in. Auto
FV-12A	IX-1 Subsurface Wash Inlet	1 1/2-in. Auto
FV-13A	IX-1 Air Scour Outlet	1-in. Auto
FV-1B	IX-1 Outlet/IX-2 Service Inlet	1 1/2-in. Auto
FV-2B	IZ-2 Backwash Inlet	1 1/2-in. Auto
FV-3B	IX-2 Acid Regenerant/Settler Rinse Inlet	1 1/2-in. Auto
FV-4B	IX-2 Outlet	1 1/2-in. Auto
FV-5B	IX-2 Backwash Outlet	1 1/2-in. Auto
FV-6B	IX-2 Spent Regenerant Outlet	1 1/2-in. Auto
FV-8B	IX-2 Fast Rinse Inlet	2-in. Auto
FV-10B	IX-2 Fast Rinse Outlet	2-in. Auto
FV-11B	IX-2 Air Scour Inlet	1 1/2-in. Auto
FV-12B	IX-2 Subsurface Wash Inlet	1 1/2-in. Auto
FV-13B	IX- Air Scour Outlet	1-in. Auto
FV-1C	IX-2 Service Outlet/IX-3 Service Inlet	1 1/2-in. Auto
FV-2C	IX-3 Backwash Inlet	1 1/2-in. Auto
FV-3C	IX-3 Acid Regenerant/Settler Rinse Inlet	1 1/2-in. Auto
FV-5C	IX-3 Backwash Outlet	1 1/2-in. Auto
FV-6C	IX-3 Spent Regenerant Oulet	1 1/2-in. Auto
FV-8C	IX-3 Fast Rinse Inlet	2-in. Auto
FV-10C	IX-3 Fast Rinse Outlet	2-in. Auto
FV-11C	IX-3 Air Scour Inlet	1 1/2-in. Auto
FV-12C	IX-3 Subsurface Wash Inlet	1 1/2-in. Auto
FV-13C	IX-3 Air Scour Outlet	1-in. Auto
FV-1D	IX-3 Service Outlet/IX-4 Service Inlet	1 1/2-in. Auto
FV-2D	IX-4 Backwash Inlet	1 1/2-in. Auto
FV-3D	IX-4 Caustic Regenerant/Settler Rinse Inlet	1 1/2-in. Auto
FV-4D	IX-4 Service Outlet	1 1/2-in. Auto
FV-5D	IX-4 Backwash Outlet	1 1/2-in. Auto
FV-6D	IX-4 Spent Regenerant Outlet	1 1/2-in. Auto
FV-8D	IX-4 Fast Rinse Inlet	2-in. Auto
FV-10D	IX-4 Fast Rinse Outlet	2-in. Auto
FV-11D	IX-4 Air Scour Inlet	1 1/2-in. Auto
FV-12D	IX-4 Subsurface Wash Inlet	1 1/2-in. Auto

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VALVE NO.	DESCRIPTION	TYPE
FV-13D	IX-4 Air Scour Outlet	1-in. Auto
HVA-201	Influent from French Drain to T-201	2-in. Ball
HVB-201	Effluent From T-201	2-in. Ball
HVA-202	Influent from French Drain to T-202	2-in. Ball
HVB-202	Effluent From T-202	2-in. Ball
HVA-203	UV Effluent to T-203	2-in. Ball
HVB-203	IX Feed From T-203	2-in. Ball
HVA-204	Regenerant Effluent to T-204	2-in. Ball
HVB-204	Regeneration Clean Water From RFP	2-in. Ball
HVC-204	Regeneration Clean Water to P-3	2-in. Ball
HVA-205	Plant Effluent/T-205 Influent	2-in. Ball
HVB-205	T-205 Discharge	4-in. Butterfly
HVC-205	T-205 Recirculation	4-in. Butterfly
HVA-206	Plant Effluent/T-206 Influent	2-in. Ball
HVB-206	T-206 Discharge	4-in. Butterfly
HVC-206	T-206 Recirculation	4-in. Butterfly
HVA-207	Plant Effluent/T-207 Influent	2-in. Ball
HVB-207	T-207 Discharge	4-in. Butterfly
HVC-207	T-207 Recirculation	4-in. Butterfly
HVD-207	T-207 Isolation	2-in. Ball
HVA-208	Caustic Inlet-Truck Dock	2-in. Ball
HVB-208	Caustic Outlet-T-208	2-in. Ball
HVA-209	Acid Inlet-Truck Dock	2-in. Ball
HVB-209	Acid Outlet-T-209	2-in. Ball
HVA-210	P-210 Inlet	2-in. Ball
HVB-210	P-210 Outlet	2-in. Ball
HVC-210	Discharge Camlock	2-in. Ball
HVD-210	Discharge Truck Dock	2-in. Ball
HVA-301	P-301 Inlet	2-in. Ball
HVB-301	P-301 Outlet	2-in. Ball
HVA-302	P-302 Inlet	2-in. Ball
HVB-302	P-302 Outlet	2-in. Ball
FCV-1	Fail Close Plant Effluent	1 1/2-in. Solenoid
FCV-2	Fail Close Recycle	2-in. Diaphragm
FCV-3	Collection Gallery Flow Control	2-in. Diaphragm
FCV-4	UV Effluent Control	1/2-in. Ball